

March 11, 1958

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2,826,710

REFLECTOR TYPE LAMP

Filed July 28, 1953

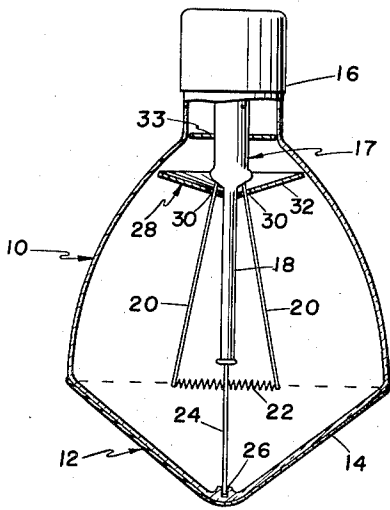


Fig. 1

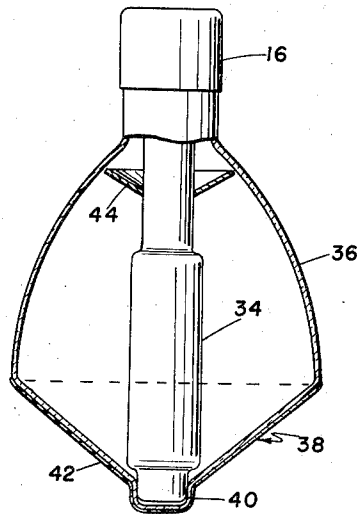


Fig. 2

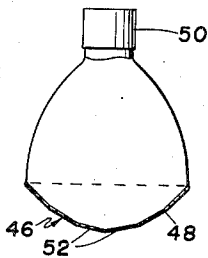


Fig. 3

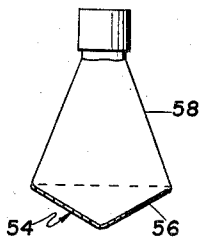


Fig. 4

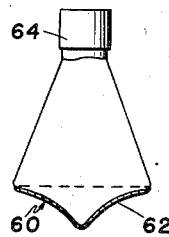


Fig. 5

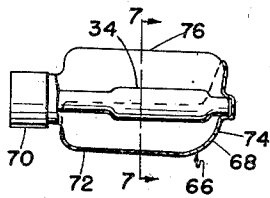


Fig. 6

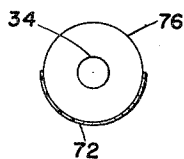


Fig. 7

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AGENTS FOR APPLICANT

1

2,826,710

REFLECTOR TYPE LAMP

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Application July 28, 1953, Serial No. 370,680

4 Claims. (Cl. 313—113)

The present invention relates generally to electric lamps and more particularly to a reflector type lamp having specially shaped and positioned reflector elements.

The primary object of this invention is to provide a lamp wherein the blocked light is minimized and the efficiency thus increased and to this end the lamp has a bulb which is outwardly extended at the end and is coated with a reflective material on the extended portion. In this connection it should be noted that a deflector having a light reflecting surface has been added in the neck of the lamp, and this element acts independently and in combination with the first mentioned reflector to further reduce the percentage of blocked light.

Another object of this invention is to provide a lamp wherein the light output pattern may be controlled by variations in the structural shape of the extended generally conoidal portion and the reflector.

Another object of this invention is to provide a lamp in which the light generating element is supported additionally at its outer end by the conoidal portion of the bulb.

Another object is to provide a reflector type lamp, the bulb structure of which is adaptable to many types of bases, and which may be manufactured in various sizes to suit many specialized needs including vehicle headlights.

Another object of this invention is to provide a reflector type lamp which is inexpensive and practicable to manufacture.

Finally, it is an object to provide a reflector type lamp of the aforementioned character which is simple, safe and convenient to use, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which forms a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the views of the drawing, and in which:

Fig. 1 is a longitudinal sectional view of the lamp fitted with a conventional filament.

Fig. 2 is a longitudinal sectional view of the lamp fitted with a mercury vapor type element.

Figs. 3, 4, 5 and 6 are reduced diagrammatic sectional views of lamps having slightly modified conoidal portions.

Fig. 7 is a transverse sectional view taken on the line 7—7 of Fig. 6.

Referring now to the drawing, the lamp comprises a bulb or envelope 10 having an outwardly conoidal end 12 which is provided with a reflector 14 in the form of a metallic coating or the like, the reflective surface being located on the inside or outside of the bulb and angularly disposed to prevent virtually all inter-reflectance or multiple reflectance between different portions of the reflector 14 and to direct substantially all the reflected light so as

2

to avoid the parts of the lamp adjacent to the base thereof. This considerably increases the efficiency of the lamp because light directed onto neck and base portions of conventional lamps is largely converted into heat and is lost as blocked light. For example, a conventional globular lamp has the light generating unit adjacent the center curvature of the bowl portion, so that interreflectance and blocked light represents a hitherto unrecognized disadvantage. The bulb 18 is fitted with a base 16 which may be of any conventional design to fit existing electrical sockets.

Within the bulb 10 is a filament mount 17 including a stem 18 from which protrude the lead-in wires 20 carrying the filament 22, this portion of the structure being conventional. The stem 18 has an extended portion 24 which is slidably supported in a socket 26 formed integrally in the tip of the conoidal end 12. Thus the stem 18 is additionally supported at its end, a feature which increases the rigidity of the filament assembly and reduces the possibility of breakage. The sliding joint of the extended portion 24 in the socket 26 allows for unequal expansion of the lamp structure, so preventing distortion.

Attached to the filament mount 17 adjacent the base of the bulb is a deflector 28 having suitable apertures 30 to clear the lead-in wires 20. This deflector 28 is polished or otherwise provided with a heat and light reflecting surface 32, facing the filament, to direct light outwardly of the lamp. Reflection from the deflector 28 is primarily concerned with increasing efficiency of the lamp by preventing loss due to blocking of light otherwise reaching the neck and base portions of the lamp. It will also be noted that the deflector 28 functionally cooperates with the reflector 14 by secondarily reflecting outwardly the small amount of light which the reflector 14 directs toward the neck and base portions of the lamp.

Above the deflector 28 is a baffle 33 which is fastened to the stem 18 in the narrow neck portion of the bulb, said baffle preventing circulation of hot gases into the neck portion and thereby reducing excess heating of the base 16. During the operation of the lamp, the filament 22 gradually vaporizes, the minute quantities of vapor tending to settle on the cooler portions of the bulb as a dark deposit. The vapor is carried by the circulating gases and passes between the deflector 28 and the wall of the bulb 10, the vapor then settling and/or condensing on the inner surface of the bulb between the deflector and the baffle 33, on the baffle itself, or on the rear side of the deflector. Thus the metallic deposit is confined to the portion of the bulb adjacent the neck and behind the deflector 28, so that the light output of the lamp is unimpaired.

The lamp described above is not limited to use with a filament type light source, but may also be used with other types of light generators such as the mercury vapor type tube 34 shown in Fig. 2. In this particular form of the lamp the bulb 36 has a conoidal end 38 which is provided with a socket 40 in which the end of the tube 34 is slidably held. The conoidal end 38 is, of course, fitted with a reflector 42. The arrangement of the lamp is thus similar to that described above. The deflector 44 is fitted around the tube 34 adjacent the base of the bulb and is similar in design and function to the deflector 28.

The bulbs shown in Figs. 1 and 2 utilize a basically simple conoidal end design, the angular relation of the sides of the conoidal portion and the reflector with respect to the light generating unit is critical to the extent that this angle must be such that substantially all reflected light is reflected out of the lamp rather than being reflected back toward the center of the lamp or toward the neck and base of the lamp. The shape of the conoidal end, and consequently the shape of the reflector, largely governs the light pattern produced by the lamp. The

3

lamps represented in Figs. 1 and 2 are substantially identical insofar as the teaching of this disclosure is concerned, the second figure being included to show the adaptability of the invention to nonfilament types of lamps. This light pattern may be varied to suit particular needs by changing the shape of the reflector as shown by the examples in Figs 3 to 6.

In Fig. 3 there is illustrated a lamp with a faceted end portion 46 having a reflector 48 which distributes the light from the lamp in many directions while avoiding reflectance of any appreciable portion of the reflected light toward the parts of the lamp adjacent the base 50 thereof. This is accomplished, in part, by having the facets 52 at the center of the reflector inclined at an acute angle to the center line of the lamp.

Fig. 4 shows a bulb with a conoidal end 54 having a reflector 56 similar to that shown in Fig. 1, but having a reduced altitude in the conoidal parts and the sides 58 of the bulb define a frusto-conical form. In Fig. 5 there is illustrated a bulb having a generally conoidal end 60 having a reflector 62 with sides arcuate when viewed in vertical cross-section with the base 64 disposed upwardly.

The lamp shown in Fig. 6 has an asymmetrical portion 66 which may be considered generally conoidal and a reflector 68 thereon which extends along one side of the bulb as indicated at 72, and the reflector is also extended across the end portion 74 of the bulb remote from the base. This particular arrangement causes the light to be emitted exclusively from one side 76 of the bulb and the lamp is ideally suited for street, store, auditorium and stage lighting and for many special installations, with the bulb mounted horizontally.

It will be evident that by moderate changes in the shape of the reflector portion of the bulb, the light pattern of the lamp may be accurately controlled to suit particular needs without the necessity for additional exterior reflectors. In all embodiments of this invention, however, there will be an envelope or bulb having a large transparent or translucent portion and a large reflector portion, and the reflector portion must have virtually all parts thereof angularly disposed with reference to the light generating unit to direct reflected light out of the bulb and to avoid reflecting light toward the neck and base of the lamp, thereby practically eliminating blocked light. The reflector carrying deflector, such as illustrated at 30 and 44 further reduces blocking of light within the lamp, thus increasing efficiency of the lamp.

The operation of this invention will be clearly compre-

4

hended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary.

It is understood that minor variation from the forms of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. A lamp comprising: a base structure; a bulb secured to said base structure and having a protrusion and a recessed portion in said protrusion disposed opposite to said base structure; a light generating element comprising an elongated tube, substantially coextensive with said bulb in length, and having one end operatively mounted in said base structure and the other end thereof received in and supported by said recessed portion.

2. A lamp according to claim 1 wherein said recessed portion and a portion of the bulb adjacent to said recessed portion is opaque and reflective with respect to light emanating from said element.

3. A lamp according to claim 1 wherein a side portion of said bulb, extending substantially from said recessed portion to said base structure, is opaque and reflective with respect to light emanating from said element.

4. A lamp according to claim 1 wherein said recessed portion, an end portion of the bulb adjacent to the recessed portion, and a side portion of the bulb extending substantially from said recessed portion to said base structure are opaque and reflective with respect to light emanating from said element.

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